P8 F1

2) $\omega_z(t) = \gamma - \beta . t^2 \rightarrow \gamma = 5{,}0 \text{ rad/s}$

$\beta = 0{,}8 \text{ rad/s}^3$

a) aceleracion angular en funcion del tiempo

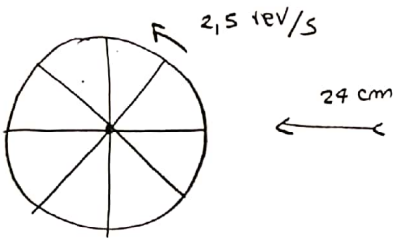
$$\alpha = \frac{d\omega}{dt} = -2\beta t$$

b) $t=3$ $\quad \alpha = -2\beta . t = -4.8 \frac{\text{rad}}{s^2}$

$$\alpha_{media} = \frac{\omega(t=3) - \omega(t=0)}{3-0} = \frac{-2.2 - 5{,}0}{3} = -2.4$$

5)

a)



$\omega = 2\pi . (2{,}5) = 5\pi \text{ rad/s}$

$\frac{2\pi}{8} \rightarrow$ distribucion de huecos

$\omega = \phi \rightarrow \tau = \frac{\phi}{\omega}$

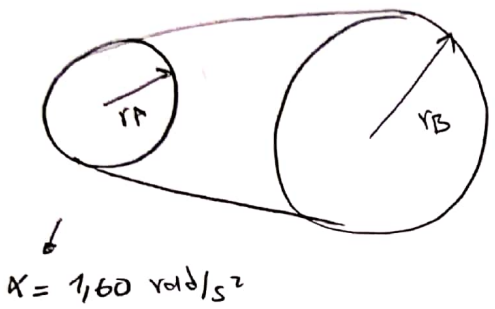
donde $\phi \rightarrow \frac{2\pi}{8}$

$$\tau = \frac{\frac{2\pi}{8}}{\frac{5\pi}{1}} = \frac{2\pi}{40\pi} = 0{,}05 \text{ s}$$

$$\Rightarrow v = \frac{\text{largo de la flecha}}{\text{tiempo que tiene para pasar}} = \frac{0{,}24 \text{ m}}{0{,}05 \text{ s}} = 4{,}8 \text{ m/s}$$

b) $\Rightarrow$ La mejor ubicacion: mas alejado del centro y justo despues de pasar un rayo. (considerando que tiro a velocidad minima)

7



$r_A = 10$ cm

$r_B = 25{,}0$

¿cuanto demora B llegar a 100 rev/min?

en A $\Rightarrow$ $\alpha = 1{,}60 \frac{rad}{s^2}$ con $\omega(0) = 0$

$$\omega_A = 1{,}60 t$$

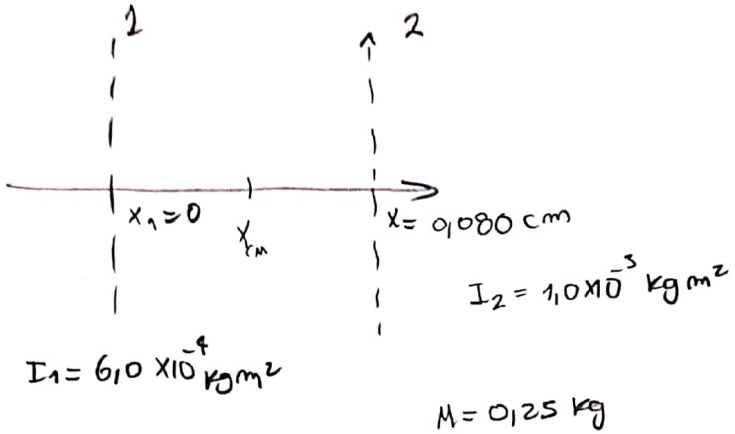
usando que $v_A = v_B$ con $v = \omega \cdot r$

$$(1{,}60 t)\, r_A = \omega_B(t) \cdot r_B \Rightarrow \omega_B = 100 \frac{rev}{min} = 1{,}\bar{6} \frac{rev}{s}$$

$$\omega_B \Rightarrow 1{,}\bar{6} \cdot 2\pi = 10{,}47 \frac{rad}{s}$$

$$t = \frac{10{,}47 \frac{rad}{s} \cdot r_B}{1{,}60 \frac{rad}{s^2} \cdot r_A} = 16{,}36 \text{ s}$$

P8 11



$I_{eje} = I_{cm} + Md^2 \rightarrow$ teorema de ejes paralelos

$$\begin{cases} I_1 = I_{cm} + M d^2 \\ I_2 = I_{cm} + M \cdot (0{,}08 - d)^2 \end{cases}$$

$$I_1 - I_2 = Md^2 - M(0{,}08 - d)^2 = Md^2 - M((0{,}08)^2 + d^2 - 2d \cdot (0{,}08))$$

$$= \cancel{Md^2} - M(0{,}0064) - \cancel{Md^2} + 2dM(0{,}08))$$

$$-0{,}4 \times 10^{-3} = -1{,}6 \times 10^{-3} + 0{,}04 d$$

$$0{,}0012 = +0{,}04 d$$

$$\boxed{+0{,}03 = d}$$